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GEOGRAPHICAL NOTES.

CARTOGRAPHY OF THE EGYPTIAN SOUDAN.—A note under this head on p. 70 of BULLETIN No. 1, for 1887, has called forth the following letter, which explains itself, and finally disposes of a story recognized as incredible, though supported by the respectable authority of *Le Mouvement Géographique*:

TWYFORD MOORS, WINCHESTER, Aug. 30, '87.

SIR:—Since my return to England my attention has been drawn to an article in the "Bulletin of the American Geographical Society," by Mr. George C. Hurlbut, "Cartography of the Egyptian Soudan," p. 70, vol. xix., No. 1, '87.

The article contains an extract from *Le Mouvement Géographique*, of Brussels, which extract is, in its turn, an extract from a paragraph taken from the Cairo *Bosphore Egyptien*. The purport of the article is that the valuable collections of maps and plans formed by the exertions of Stone Pasha were destroyed by the orders of some English officers of the Egyptian army some time in '86. I, sir, was in temporary command of the Egyptian army when the original paragraph appeared in the *Bosphore Egyptien*, and I did not deem it either necessary or desirable to take any notice of it. When, however, it is quoted in a journal so deserving of consideration as that of the American Geographical Society, it is time to contradict the statements it contained. The facts are

these: In '86, when alterations were taking place in the head-quarter office of the Egyptian army, I made arrangements for the better distribution and also security of the maps and plans belonging to the office. During this rearrangement some losses, which probably occurred during the interregnum between Arabi's fall and the restoration of order after Tel el Kebir, came to light in consulting the registries; happily few of these losses were of importance and [they] could be easily replaced.

For the rest, the value of the late General Stone Pasha's work is fully recognized by the officers of the Egyptian army. The maps, plans, and records, for which we have to thank the late lamented chief of the staff of the Egyptian army, and his talented assistants, the information collected with so much energy and devotion by Long, Prout, Colston, Purdy, and Mason, under Stone Pasha's able guidance, are properly guarded and cared for, and will be a lasting record of Stone Pasha's eminent services in Egypt. I trust that this contradiction may be given due publicity in the Journal of the Society, and beg to remain, sir,

Your most obedient servant,

HENRY HALLAM PARR,
Colonel Somerset 4th Infantry, and
Adjt.-General Egyptian Army.

HON. CHAS. P. DALY,
President American Geographical Society,
11 West 29th St.

TOPOGRAPHICAL MAP OF THE UNITED STATES.—In his Sixth Annual Report the Director of the U. S. Geological Survey gives an account of the work on the Topographical Map, up to July, 1885. The present purpose for which the map is constructed is the representation of the areal geology

of the country; but once constructed and engraved, the plates may be used in very many ways and for various ends, as in the study of drainage systems, of the regimen of rivers, of irrigation, of the distribution of forests, of catchment areas for the supply of water to cities, as well as for the laying out of highways, railroads, and canals, and for strategic and administrative purposes in war.

The organization embraces an astronomic and computing division, a triangulation corps, and a topographic corps, organized into twenty-seven parties, scattered over the United States.

The geographic basis of the map is a trigonometric survey.

The hypsometric work is based on the railroad levels of the country, and from these the reliefs for the whole area are determined. The topography is executed by a variety of methods, adapted to the peculiar conditions found, the plane table being used to a large extent.

The map sheets are on three different scales, 1:62,500, 1:125,000, and 1:250,000, or, approximately, 1 mile to the inch, 2 miles to the inch, and 4 miles to the inch. The considerations governing the scale are present or prospective density of settlement, economic importance, complexity of geologic phenomena, and degree of detail in topography.

The map is constructed in contours, with vertical intervals of 10, 20, 50, 100, and 200 feet, varying with the scale of the map and the magnitude of relief features. The unit of the map sheets is the square degree, *i. e.*, one degree of latitude and one degree of longitude. On the 4-mile scale each square degree forms one sheet; on the 2-mile scale the square degree forms four sheets; and on

the 1-mile scale there are sixteen sheets to the square degree.

The sheets are engraved on copper in three tints; the hydrography in blue, the hypsography in brown, and the lettering and culture in black.

The area of the United States, exclusive of Alaska, is about 3,000,000 square miles.

Mr. Henry Gannett, Chief Geographer, in a paper contributed to *Science*, of July 29, 1887, states that there had been mapped, up to the 1st of July of this year, 250,000 square miles. The work proceeds at the rate of something less than 60,000 square miles a year; a rate rapid enough, considering the quality of the work, to satisfy the most exacting critic.

Mr. Gannett explains that the term *culture*, as applied to this map, is limited to all such of the works of man as have relation to communities as distinguished from individuals.

The classification adopted by the Survey is necessarily not by States, and it may be of interest to add the figures for the sheets published, according to States and Territories: Alabama 2, Alabama-Georgia 1, Arizona 12, Arizona-Nevada 1, California 6, Kansas 4, Kentucky 1, Kentucky-Virginia 1, Kentucky-Virginia-Tennessee 2, Maryland-West Virginia 1, Massachusetts 3, Missouri 12, Missouri-Kansas 4, Montana 3, Nevada 5, New Mexico 2, North Carolina, 2, North Carolina-Tennessee 1, Tennessee 5, Tennessee-Georgia 1, Tennessee-North Carolina 5, Texas 9, Utah 17, Virginia-Kentucky 1, Virginia-Tennessee 1, Virginia-Tennessee-North Carolina 1, Virginia-West Virginia 2, West Virginia 3, West Virginia-Kentucky 1, West Virginia-Virginia 2, Yellowstone National Park 4.

MANCHURIA.—The *Scottish Geographical Magazine* for August, summarizes from a Parliamentary Blue Book the report of a journey in this border-province of the Chinese Empire, by Mr. Fulford, a student-interpreter in the consular service.

Passing by Mukden, Mr. Fulford crossed a spur of the Long White Mountains (Shan Alin) to the upper Sungari valley. The mountains were well wooded, and the higher portions were found to be inhabited by hunters, who, not being sufficiently protected by the Chinese authorities at Kirin, have set up a government for themselves. On the summit of the Pai Shan, in this range, an extinct volcano, 8,000 feet high, and covered for a thousand feet from the top with pumice, lies a great lake from which flow the two branches of the Sungari.

Mr. Fulford followed this river to Kirin, where he was kept for a month by rains, then proceeded to Tsi-tsi-har, and thence to Hulan, in the centre of a very fertile district, now attracting a large immigration from the south.

The people are actively engaged in the distillery of spirits from millet. At Hunchun, on the Russian and Corean border, Mr. Fulford found the Coreans trading freely and crossing the frontier as they pleased. They are invariably addressed as "Men of the Little Nation," by the disdainful Chinese, who style themselves the "Great Nation," as naturally as if they spoke French. Six miles beyond the Hunchun (?) River, in the yard of an inn, Mr. Fulford saw the brass pillar erected by the Imperial Commissioner Wu Ta Cheng, to commemorate the settlement of the disputed frontier.

On his return, the traveller visited Kuan Cheng-tzu, a busy town of 7,000 people, 80 miles northwest of Kirin.

In this excursion through the southeast portion of Manchuria, Mr. Fulford was struck by the absence of archæological remains. The mineral resources of the region seemed to be limited to a little iron, coal, and gold. The poppy was very largely cultivated, so that in the country near Hulan opium was used in place of money as a circulating medium. The foreign opium, which does not last as well as the native, has been driven out of the market.

In taking leave of Mr. Fulford's report, the *Scottish Geographical Magazine* condemns with great severity the carelessness and the blunders which deform the Parliamentary publications, especially in the matter of geographical names. The errors are so gross, that it might be supposed the documents "were produced by some hedge-side press in a district of political disturbance, rather than by the authorized printing-presses of one of the oldest and wealthiest governments in Europe."

THE NORTH SEA.—Dr. Hugh Robert Mill gives, in the August number of the *Scottish Geographical Magazine*, the results of explorations in the North Sea, made by the German gun-boat *Drache*, in the summers of 1881, 1882, and 1884.

The configuration of the sea is peculiar. It is divided from the Norwegian Sea on the N. by a line drawn from the north of Shetland to Sogne Fjord, in lat. 61°. On the E. it is bounded by the coasts from Norway to Holland, on the S. by Belgium and the 51st parallel of latitude, and on the W. by the eastern coast of Great Britain. The depth, nowhere very great, decreases rapidly to the S. and E.; and a range of banks runs N. E. from

Flamborough Head to the Skagerrack. From the British coast, to the N. and E., the water has a depth of about 50 fathoms, with a gradual increase until, at 60 miles from the Norwegian coast, there is an abrupt change of slope, producing the great gully, more than 200 fathoms deep, which encircles the southern end of the peninsula. On the N. and W. where the sea is deeper, the land is high, while on the eastern shore it is low and flat.

Communication with other waters is by three channels, one to the N., one to the S. through the Strait of Dover, and the eastern passage to the Baltic.

In the North Sea, which is agitated by tides down to the bottom, enormous quantities of fresh and brackish waters are poured in from the rivers and the Baltic, and the changes of warmth between winter and summer exert an influence wholly unfelt in the deep ocean.

The observations on the temperature of this sea have been too few to furnish a basis for any but the most general reasoning.

From Helgoland to Aberdeen the surface temperature registered by the *Drache*, fell continually from 51°.8 to 48°.6 Fahrenheit. At 8 fathoms there was a change of only .4, but at 16 fathoms the range was from 49°.8 to 44°.8.

Generally the water was warmer on the German side and on the Dogger Bank than off the Scottish coast. Six soundings between Aberdeen and Lerwick showed a steady increase in temperature towards the N. This increase was most apparent on the bottom of the sea, here 50 fathoms deep.

Seven soundings were made from Lerwick to the coast of Norway. The temperature at the surface and

for 8 fathoms below was 50° . Proceeding to the eastward it was found that colder water rose near to the surface; and the temperature at the bottom, $48\frac{1}{2}$ fathoms, up to the edge of the great Norwegian gully, fell from $46^{\circ}.4$ to $45^{\circ}.5$. On the other side of the edge and in the gully at $48\frac{1}{2}$ fathoms the temperature was above $46^{\circ}.5$. It fell gradually with increasing depth and marked $44^{\circ}.8$ at 147 fathoms.

Eleven soundings were taken in the last section, from Kors Fjord, down the deep trough, across the Skagerrack and along the Jutland coast to Helgoland.

Here there was an extraordinary increase, the surface being at 56° to 59° , and water warmer than 50° reaching down to 20 fathoms. In the deep part $46^{\circ}.5$ was marked at 25 fathoms, and $44^{\circ}.6$ to $44^{\circ}.2$ at the bottom. At 28-fathom soundings the bottom water was at $48^{\circ}.2$, and by the time Helgoland was reached it had risen to $58^{\circ}.8$.

The salinity of the sea was tested for the surface, for 16 fathoms below, and for the bottom. The mean salinity for the ocean water is 3.50 per cent. In the North Sea a small area to the N. of Orkney shows surface water with 3.55 per cent. of salt. Surface water of 3.50 salinity occupies the centre of the sea, N. of the Dogger Bank, close to the coast of Scotland, except between Berwick and Peterhead, but not approaching the E. side. In the S. there is between Yarmouth and Texel a patch of the same high percentage. South of a line from the south end of the Dogger Bank to the N. of Denmark, the surface water shows 3.45, while the rest of the sea shows a lower salinity, and the Continental side is much fresher than the British.

At 16 fathoms the 3.55 and 3.50 lines have the same

general direction as at the surface but enclose a greater area, the 3.50 line reaching the middle of the Dogger Bank and running up the Skagerrack. All the rest, except the salt streak from the Channel, is fresher, and freshens towards the shore.

At the bottom, water of 3.55 salinity comes in between Orkney and Shetland and spreads out along the coast of Norway. The 3.50 line curves away from the Scottish coast, as at the other levels, and the southern boundary of this salinity for the bottom is the same as that for the 16 fathoms; a great part of the sea towards the south not exceeding this depth.

Dr. Mill thinks it probable that the tidal effects in the North Sea are produced by a combination of a stationary east-and-west wave with a progressive wave; and he gives this general description of the phenomena:

“The great Atlantic tide-wave, advancing from the west, divides at the Shetland Islands, one tide-wave enters the North Sea from the N. W., the other passes over to the Norwegian coast, where it is reflected, and moving S. W. from about Kors Fjord, meets the direct branch, and with it gives rise to a series of east and west cotidal lines of simultaneous high water. In latitude 54°, between Flamborough Head and Helgoland, the tidal current runs alternately eastward and westward, the period of high water at each end of the range being six hours apart.”

It has been proved that the tide through the Strait of Dover has no appreciable effect in the North Sea.

THE ADIRONDACK AND STATE LAND SURVEYS.—The latest Report of the Superintendent, Mr. Verplanck

Colvin, (for 1885,) gives a sketch of the work of these surveys from their beginning in a private enterprise of his own in 1865. He had found in his examination of certain wild districts of the State that the old maps in the office of the State Engineer abounded in errors, mostly due to the local attraction of magnetic iron ores; and he made yearly explorations at his own expense during the period 1866-1871. In 1870 he made several ascents and measurements of Mt. Seward, which was found to be but 4,400 feet high, instead of 5,100; and it occurred to him that many other recorded elevations might be erroneous. This proved to be the case, and it was plain that an accurate survey could only be made by a triangulation developed from precisely measured base-lines located on the cleared plains at the margin of the wild region.

Application was made to the Legislature, which voted an appropriation for the survey.

During the first year's work, in 1872, the highest source of the Hudson River was discovered in Lake Tear-of-the-Clouds, near Mt. Marcy, at a height of 4,351 feet above the sea; and the dividing line between the head-waters of the Hudson and the St. Lawrence was traced and mapped.

The survey has accurately determined thousands of positions and, in this way, rectified numberless boundary lines and recovered disputed lands. About one half of the region has now been covered by the trigonometrical measurement, and the topographical sketching is well advanced.

The counties included in the State Land Survey are: Clinton, Essex, Franklin, Fulton, Hamilton, Herkimer, Lewis, Saratoga, St. Lawrence, and Warren, covering an area of nearly 15,000 square miles in Northern New York.

The lands belonging to the State in these ten counties amount to 750,000 acres. They contain nearly all the forest territory remaining in possession of the State, and also, it is believed, valuable mineral deposits.

Much of this region is unsuited to agricultural pursuits. Mr. Colvin says: "Between 1,500 and 2,000 feet above the sea frosts are not uncommon in summer, and I have known the entire crop of Indian corn in one of the most fertile valleys, having an elevation of only 900 feet above the sea, destroyed by frost in a single night early in August. Oats, however, and other hardy cereals can be profitably grown upon lands reaching an elevation of 2,000 feet above the sea, and potatoes will thrive wherever there is soil to cover them. Sheep and hardy cattle may be raised on the lowlands, but the hay crop is insufficient for the long and tedious winters."

Much of the region, he concludes, must remain a forest, and its value to the State can hardly be overestimated, when it is remembered that here are the sources of the Hudson, the Mohawk, and many smaller streams.

The rainfall of this region has been systematically observed for a period of four or five years, and the Report gives a table of the records kept at the stations, besides observations of the temperature at three of them. At Keene Valley, Essex Co., the rainfall was: for 1879, 28.38 in.; for 1880, 32.12 in.; for 1881, 30.63 in.; for 1882, 27.62 in.; and for 1883, 29.10 in.

At Edmund's Ponds, Essex Co., the figures were: for 1879, 42.68 in.; for 1880, 48.31 in.; for 1881, 46.07 in.; for 1882, 41.21 in.; and for 1883, 43.80 in.

At Elizabethtown, Essex Co., the record was: for

1879, 17.91 in.; for 1880, 29.55 in.; for 1881, 26.69 in.; and for 1882, 22.84 in.

The Adirondack Mountains lie almost wholly within Essex County.

At Pottersville, Warren Co., the rainfall was: for 1879, 28.34 in.; for 1880, 25.21 in.; for 1881, 26.18 in.; and for 1882, 20.03 in.

At Plattsburgh, Clinton Co., the record was: for 1880, 23.61 in.; for 1881, 21.59 in.; for 1882, 25.28 in.; and for 1883, 24.05 in.

At Clinton Prison, Clinton Co., the rainfall was: for 1880, 44.67 in.; for 1881, 50.81 in.; for 1882, 41.89 in.; and for 1883, 50.68 in.

These figures indicate an increase of precipitation with the altitude, Edmund's Ponds, in Essex Co., being 1,000 feet higher than Keene Valley, in the same county, and Clinton Prison 1,200 feet above Plattsburgh. It is noted, also, that storms are frequent in the vicinity of Clinton Prison.

Mr. Colvin gives for comparison the observations made in past years at Plattsburgh Academy. For 1847 the rainfall was 47.26 in.; for 1848, 32.00 in.; and for 1849, 35.02 in.; a mean for the three years of 38.09, while the mean for 1881, 1882, and 1883 is 23.64.

In the interval between these periods a great portion of the forest in Clinton and the adjacent counties was cut away.

The mean temperatures registered at Keene Valley were: for 1879, 40°.66; for 1880, 41°.69; for 1881, 41°.93; for 1882, 40°.54; and for 1883, 39°.36. The lowest recorded monthly temperature was for January, 1881, 10°.52, and the highest, 64°.07, in July of the same year.

At Plattsburgh the mean temperature for 1880 was 44°.76; for 1882, 43°.66; and for 1883, 41°.19. The lowest record was for January, 1883, 11°.99, and the highest, 69°.92, for July, 1880.

At Clinton Prison the mean for 1880 was 44°.29; for 1881, 42°.81; for 1882, 43°.88; and for 1883, 42°.65. The lowest monthly mean was 16°.12, for January, 1881, and the highest, 67°.90, for July, 1880.

At each of these stations January was almost invariably the coldest, and July the hottest, month of the year.

AREA AND POPULATION OF EUROPE. — The *London Times*, of Aug. 24th, publishes as the work of Gen. Strelbitski some curious figures concerning Europe. According to these the area of that continent is 6,233,060 square miles; only 2,409,677 more than Behm and Wagner allow. The Russian Empire in Europe alone, it seems, covers more than half of the whole continent, embracing the kingdom of Poland, the grand duchy of Finland, and part of the Caucasus. There can be no valid reason why Poland and Finland and part of the Caucasus should not be embraced by the Russian Empire, if that is what the *Times* would say, or by the whole continent, to which they belong. Embracing is not by any means the least innocent recreation in the world.

Unlike some political economists, the *Times* is quite as generous to its own people as to foreign nations, and, with the *Statesman's Year-Book* open before it, makes the United Kingdom larger than it is by 75,783 square miles.

With these liberal views on the land question there is combined a surprising respect for facts on the subject of

population, except in the case of Switzerland, which is credited in the *Times* office with 5,000,000 inhabitants more than it possesses, unfortunately for the world.

It is not easy to understand the measurements given, for, whether read as miles, or as versts, or as kilomètres, they are irreconcilably at war with the facts; and it is mere wantonness to print a hotchpotch of the kind under the name of Gen. Strelbitski.

A GOOD EXAMPLE.—The Council of the Buenos Aires *Instituto Geográfico Argentino* unanimously adopted, on the 17th of June, 1887, the following Resolution:

“Hereafter no explorer, aided by the funds or supported by the influence of this Institute, will be allowed to bestow upon any spot the name of a person holding an official position in the Republic.”

TRISTAN DA CUNHA.—The *Gazette Géographique* has recently published a number of communications on the subject of these islands and the orthography of the name by which they are known. Many of the gazetteers and maps give the incorrect form *d'Acunha*, and this tends, like most errors, to perpetuate itself.

The islands were discovered in 1506 by the Portuguese navigator, Tristão da Cunha, and received their name in consequence. This name is now applied only to the largest island, the other two being called, respectively, Inaccessible Island and Nightingale Island. The story of the discovery is told by Barros in the *Da Asia*, Dec. II., Liv. 1, Cap. 1:

“E quando veio ao atravessar aquelle grande golfão, que jaz entre esta terra e a do Cabo de Boa Esperanca

metteo-se em tanta altura da parte do Sul, por lhe ficar dobrado, que começaram alguns homens pobres de roupa de lhe morrer e a gente do mar andava tão regalada (regelada), que não podiam marear as vélas; na qual travessa descobrio humas Ilhas, que ora se chamam do nome de Tristão da Cunha.”

“And when he came to cross that great ocean which lies between this land (Brazil) and that of the Cape of Good Hope, he sailed so far into high southern latitudes in order to double the Cape, that some of his men, who were thinly clad, began to die off, and the seamen were so benumbed with cold that they could not handle the sails; and it was in this voyage that he discovered certain islands, which are now called by the name of Tristan da Cunha.”

In Dec. IV., Liv. III., Cap. I., which describes the voyage of Nuno da Cunha to India, there is the following passage:

“Com bom tempo chegou em poucos dias ás Ilhas, que se chamam do nome de seu pai Tristão da Cunha, por as elle descobrir quando foi á India (como já dissemos) . . .”

“With good weather he arrived in a few days at the islands, which are called by the name of his father, Tristan da Cunha, because he discovered them when he went to India (as we have already said) . . .”

And Camoens (*Os Lusíadas*, Cant. X., Est. 39), not having before his mind the dread of the foreigner's reckless spelling, predicts the lasting fame of the navigator:

“Pelo Cunha tambem ; que nunca extinto
Será seu nome em todo o mar, que lava
As ilhas do Austro, e praias, que se chamam
De São Lourenço”

“By Cunha likewise ; and never shall his name be forgotten in all the sea that bathes the islands of the south and shores, that are called of San Lorenzo.”

It was Tristan da Cunha who first surveyed the East African coast as far as Cape Gardafui, the island of Socotra, and the shores of Madagascar (San Lorenzo).

OCEAN CURRENTS CONTIGUOUS TO THE COAST OF CALIFORNIA.—In the Bulletin of the California Academy of Sciences for June, 1887, Dr. C. M. Richter has an interesting study of the ocean currents on the California coast, from the recorded observations with the thermometer. At Trinidad Head, a little N. of 41° N. Lat., the temperature of the surface water 10 miles off shore is $48^{\circ}.5$; at 220 miles from the shore it is $54^{\circ}.8$. At San Diego the surface water 10 miles off shore has a temperature of $59^{\circ}.8$, and at 220 miles from shore, one of $59^{\circ}.6$. The surface temperature of Trinidad Head at ten miles from shore is found at a depth of 100 fathoms, 10 miles from San Diego. At 50 miles out to sea the surface temperature of $50^{\circ}.2$ off Trinidad Head agrees with that found off San Diego at 200 fathoms.

The average depth of the ocean 50 miles from the shore is 1,000 fathoms. At this distance a submarine mountainous grade, highest on the latitude of Point Carmel, about 36° N. Lat., alters the isothermal lines of the ocean. Another grade tending S. to San Diego has a similar effect on the temperature of the water.

All the isothermal lines 50 miles off shore show generally a constant increase towards San Diego. One hundred miles off shore the same regularity is observed, and at 220 miles the lines show a slow but constant increase, mainly of surface temperature, towards San Diego.

Off San Diego the temperature of the surface water is highest nearest the shore; the case is reversed off Trinidad Head.

A cold-water current of 45° to 50° in winter, 150 miles wide, exists on the northern boundary line of California, passing southward near the coast, and narrowing as it advances till it reaches Point Conception, where it is partly deflected to the S. W., and partly buried by warmer waters.

West and south of this cold current is a great body of water with a winter temperature of 55° to 60°, and with a southerly direction in the N. of California.

Dr. Richter concludes, from Commander Belknap's observations on the temperature of the Pacific, that the Arctic currents are strong enough to alter the direction of the Kuro Siwo, or Japanese warm current, and that while this trends eastward it perhaps nowhere washes the shores of the United States, because it is separated from them, to all appearances, by the narrow cold stream. At the same time the Kuro Siwo is near enough to the coast to influence the climate. What is called the eddy current, running N. along the California coast, is, in Dr. Richter's opinion, a still unknown scientific quantity. He is inclined to think that this current may be accounted for in a great measure by the influence of the prevailing winds and the trend of the coast.

The paper is admirably illustrated by eight tinted profiles of the ocean and the coast.

THE STANLEY EXPEDITION.—*Le Mouvement Géographique* of August 28th, gives a summary of the tidings received from Stanley up to June 20th. Leaving Cairo on

the 6th and Zanzibar on the 23d of last February, the expedition arrived at Banana on the 18th of March, at Matada on the 21st of the same month, and at Leopoldville on the 20th of April. On the 1st of May the whole force of 612 men left Stanley Pool. Accidents to the *Peace* and the *Stanley* caused some delay at Bolobo, where an entrenched camp was established, with a force of 125 men to hold it.

Leaving Bolobo with 640 men, Stanley reached Bangalla on the 30th of May. This portion of the trip was entirely pleasant; the natives were friendly, and provisions were obtained in abundance. At Bangalla the expedition separated, Tippoo Tip going on to the Falls, while Stanley followed the route by the Congo and the Aruwimi.

On the 18th of June he arrived at Yambuya. In his letter to Sir Francis de Winton he says: "We captured Yambuya with our steam whistles. We had wasted three hours in palavering with the natives, who began to look ugly at last, and to brandish their spears and shields. The scream of the steam whistle put them to flight. Next morning we found the village deserted. On all sides there are little villages composed of huts with roofs like extinguishers, and behind these there are broad savannas. Our scouts captured some of the natives, whom we dismissed with presents."

An entrenched camp was immediately constructed. Here Maj. Barttelot was to be left in command of 130 men, while Stanley, with 4 Europeans and 468 natives and Zanzibaris, set out on his march to Wadelai.

On the 19th of June he wrote to a friend at Brussels: "Every thing goes well. I expect to start in a few days, and to reach Emin about the 15th of August."

THE REPUBLIC OF COUNANI.—Since the disappearance of Orélie the First, king of Araucania, there has been no dignitary, at once so solemn and so shadowy as M. Jules Gros, President for life of the Republic of Counani. This republic is somewhere between French Guiana and Brazil. A Counanian never knows whether he is in his native land, or out of it, for the republic covers something between 24,000 and 175,000 square miles. There is, in either case, room for all, the whole population being 700. The capital, Counani, contains 350 persons, 35 houses, and the plan of a presidential palace. There is an order of the Star of Counani of which Mr. Gros is Grand Master, the Grand Crosses and Knights being the rest of the population. Two lines of vessels have been established, one to Cayenne, the other to Pará, and these will enable the republic to secure a monopoly of the chores in both places.

Mr. Gros ought to be proud that he has compelled the Brazilian minister in Paris and the French minister for foreign affairs to talk about him, and to send an official note to the *Temps*, warning off the millions who are eager to become Counanian stars.

AN EGYPTIAN IN THE HEDJAZ.—Mohamed Sadik Pasha writes, in the *Bulletin* of the Khedivial Geographical Society, an account of his journey to Mecca in 1885, as agent of the treasury, specially appointed to accompany the *Mahmel*, or covered litter, sent every year with the sacred carpet which is manufactured at Cairo for draping the Kaaba. This carpet is composed of eight pieces of black silk (two for each side of the Kaaba), and two curtains, one for the inner and one for the outer door, besides a carpet and a curtain for the mausoleum of Abra-

ham, which faces the Kaaba. A stone enclosed in the mausoleum bears what are supposed to be the footprints of the patriarch. The carpet costs 4,500 Egyptian pounds (\$22,500), and the appropriation for the journey amounts to 11,700 E. P.

The mission left Cairo on the 3d Sept. by railway for Suez, and there took the steamer for Jiddah. The crowd of pilgrims was so great that the fare was reduced to 7 francs; but the steamers charged 75 francs for the return voyage. Jiddah was reached in three days from Suez.

The houses of Jiddah, 2,000 in number, are built of stone and are from 2 to 5 stories in height. Outside of the city wall is the Turkish military station, and near this stands the tomb of Eve, who must have been a remarkable person to look at, for the tomb is 492 feet long and 13 wide.

Jiddah contains about 20,000 people, fifty of them Europeans. The water supply is drawn from cisterns, and the city is far from healthy, fever prevailing the whole winter. There is some trade in grain and silks, but the principal business is the slave-trade.

Mecca, which is distant 33 hours by camel and ten and a half by ass travel, was reached in two stages of night march from Jiddah.

The mosque, with the arcades around it, is 630 feet long and 433 broad. The gallery formed by the arcades is a little over 60 feet wide. The Kaaba, placed almost in the centre of the mosque, is a nearly square chamber, 33 feet by 39, with a single door, the sill of which is between 6 and 7 feet from the floor.

Mecca stands in a valley surrounded by mountains. A man can go from one end of the city to the other on foot in forty minutes.

There is no business but that caused by the presence of the pilgrims, and the trade in the water of the well Zem-Zem, the sacred spring near the Kaaba. Provisions are imported. Eighteen hours to the S. E. is the little village of Taif, famous for its soft climate and fruits and gardens. Here the rich people of Mecca pass the summer. In the village there are two stones which the Arabs adored, before the coming of Islam, under the names of the god *Lat* and the god *Izza*.

Among these people the women go with their faces uncovered. Marriages are arranged by the simple decision of a relative of the woman. There is no contract made before a sheik, and no mention of dowry.

In going to Arafat, which is six hours S. W. of Mecca, the whole body of the pilgrims, with the two Mahmels, the Syrian and the Egyptian, halted at Gebel-el-Rahma (the Hill of Compassion) an hour and a half before the setting of the sun. The multitude, gathered behind the two Mahmels, cried with a loud voice, praying for the benediction and the mercy of God, the All-Powerful, the Only, the Creator of the Universe.

When the sun had set, the prayer ceased. Then numberless torches were lighted, and the procession headed by musicians and by the two Mahmels, set out towards Mozdalifa, which is two hours and twenty minutes from Mt. Arafat. The pilgrim who fails to be present at Arafat on this occasion, or for some hours in the night following, has made his pilgrimage in vain.

At break of day the next morning, having joined in the morning prayer and listened to the sermon on the first day of the great Bairam (Feast of Sacrifice), the pilgrims moved to Mona, at two hours' distance. There, besides

the sacrifice of the great Baïram, each pilgrim made, according to his means, his offering of sheep or camels. Three days were spent at Mona in religious exercises, notwithstanding the excessive heat and the evil smell from the bodies of the animals that had been sacrificed.

The caravan then returned to Mecca, where the Mahmel was taken from the back of the camel before the door of the mosque and carried into the interior.

The heat during this journey was very great. On the Red Sea the thermometer marked from 89° to 95° Fahr.; at Jiddah it stood at 98°; and half way on the road to Mecca it reached 108°.

There are stationed at Mecca and in the neighborhood five regiments of Turkish infantry and three of cavalry; and at Medina one cavalry regiment, with three regiments of infantry. There are besides in the Hedjaz two artillery regiments; and six war ships cruise on the Red Sea between Bab-el-Mandeb and Yambo. The boundaries of the Hedjaz are: on the S. Assir, the plain of Nejd on the E., Syria on the N., and on the W. the Red Sea. The area is about 450,000 square miles. The revenue amounts to 1,533,933 Turkish piastres (\$76,700), and the expenditures to 15,518,904 Turkish piastres (\$775,945).

The inhabitants number about 700,000, divided into a great number of tribes, that of Saharie, with 30,000 souls, being the largest. To this tribe and nine or ten others of the Beni-Harbé the Turkish and Egyptian governments make annual distributions of corn and money.

Some of the tribes dwell in cabins, and possess cultivated grounds and date-trees. Others live in tents, and depend upon their flocks. All are Mussulmans, though

some have modified their faith and their practices. The tribe of Abu-Debaâ, which claims descent from Zeïd, grandson of Ali, allows the marriage of two sisters to the same man, and the remarriage of a divorced woman the same day, without waiting the three months and ten days prescribed by the Mussulman law. The Bedouin of this tribe bury their dead with bread, water, and two sticks. They practise brigandage, and anarchy prevails among them, though they listen with respect to the counsel of the aged. They do not marry with other tribes. The men alone drink coffee and smoke, and their women are kept apart. Their food is dates, with butter, and meat, with honey. Bread is very rare among them, and they have neither cattle nor buffaloes, and their meat is of camels and sheep. They have very little poultry, and they make no use of vegetables, which, they say, enfeeble the body.

THE SOURCE OF THE ORINOCO.—The Paris Geographical Society publishes, in its *Compte Rendu*, No. 9, for 1887, extracts from two letters, one of March 19th, the other of March 25th, written by M. Chaffanjon from Ciudad Bolívar, Venezuela.

In one of these letters M. Chaffanjon says: "I returned on the 10th of March from the sources of the Orinoco. I was lucky enough to reach the sources of the river, and to give serious study to the communication of the Amazon with the Orinoco through the Cassiquiari. I send with this to the ministry a report on the description of the Upper Orinoco and the discovery of the sources. I send, moreover, nearly a hundred astronomical observations which will furnish the means of laying down

exactly the course of the river, a series of eighty words of various Indian tongues, and the tracing of my map of the Orinoco from the mouth of the Meta to the source of the river."

Here are surely sources enough, even for the Orinoco, and there should be left no doubt as to the discovery.

There is, nevertheless, room for doubt. Count Stradelli, another explorer, writes from Carácas, on the 27th of March: "One thing disturbs me: the news received within the last few days that the sources of the Orinoco have been discovered by a Frenchman, M. Chaffanjon, lately returned to Ciudad Bolívar. . . . I confess that this would annoy me not a little; but, if the thing is true, I shall have to be resigned. . . . If I am not to be the first, I shall be the second; and—patience!"

On the 29th he writes: "I have read the original letter in which Chaffanjon announces his discovery. And now that I have read it, do you want to know plainly my real conviction? It is that he has done just what Diaz de la Fuentes (?) did. He has gone as far as the Guaharibos (the famous rapids), and has turned back without passing one step beyond what had been discovered more than a hundred years before."

In a third letter, dated at Ciudad Bolívar on the 4th of April, Count Stradelli says:

"In a few moments I shall leave Ciudad Bolívar for the Upper Orinoco. . . . The sources, moreover, are yet intact. I have made the acquaintance of Chaffanjon, who is still here, have seen his map and heard his story, and it is just as I have already told you. He did not go beyond the point reached by Diaz de la Fuentes."

These letters are given in the *Bollettino* of the Italian Geographical Society for July.

M. Chaffanjon's second letter, already mentioned, is addressed to M. de Lesseps, as President of the Paris Geographical Society.

In this letter the French traveller tells M. de Lesseps that the sources of the Orinoco are enclosed by a chain of mountains in the form of a fan, and that he, as the discoverer, has bestowed upon this chain the name, not so brief as it might have been, of the "Ferdinand de Lesseps Mountains."

The multiplying of names is a thing to be deprecated and even, in certain cases, to be opposed, and there is no reason why M. Chaffanjon's range should not continue to be known as the Sierra Parima.

TIDES OF THE MEDITERRANEAN.—Mr. L. Haschert brings together, in the *Deutsche Rundschau für Geographie und Statistik* for July, the results of observations on the ebb and flow of the *tideless sea*, so called even to this day in school geographies, as well as in poetry. There are true tides in the Mediterranean, as there are in the Atlantic and in the Channel.

Along the coast of the Alpes Maritimes the mean difference between high water and low is from 6 to 8 inches. The least rise is about 4 inches at the first and the last quarter of the moon, while the highest does not exceed 10 inches.

There are three places in the Sea where the rise and fall of the tide are much more strongly marked than elsewhere. These are: the entrance to the Bay of Gibraltar, the Upper Adriatic, and the Gulf of Gabes near Sfax. At Gibraltar the tide rises from 5 feet to 6 feet 6 inches.

There is nothing like this in the Adriatic, where the

height of the tide increases gradually towards the upper end. At Brindisi the rise is 8 inches, at Ancona 1 foot 4 inches, at Venice 1 foot 8 inches, and at Trieste 2 feet 4 inches. The Adriatic displays, on a smaller scale, the same phenomena as the Bay of Fundy, where the waters are accumulated and pressed upward by the inflow. The same causes produce similar effects in the Gulf of Gabes, between Karkenah Bank and the Island of Djerba, where the tide rises to 5 feet, and even, at times, to 5 feet 6 inches.

There are many as yet unexplained anomalies in the movements of the Mediterranean waters. At Fiume the tide flows and ebbs but once in twenty-four hours, and the time of flood does not change with the passage of the moon across the meridian. It remains the same for weeks together, and advances on the average only two hours in the month, so that it takes a whole year to return to the same hour of the day. At Negropont, at certain stages of the moon, the tide ebbs and flows fourteen times in twenty-four hours. These anomalies must be largely due to the topographical conditions. Even on the coast of the Alpes Maritimes, where the rise is so slight, there are in winter occasional much higher tides, which cannot be wholly referred to the attraction of the sun and the moon. The atmospheric pressure and the influence of the wind, especially the former, must be taken into account. With the rise of the barometer the water falls, sometimes a fourth lower than at ebb tide, and observations at Nice, Cannes, Monaco, and other points, show that the level of the sea may be lowered by this cause alone as much as 1 foot 8 inches.

Another interesting fact is that the tides depend on the sun's attraction, the influence of the sun-wave, which is

elsewhere blended with that of the moon-wave, being clearly distinguishable in the western Mediterranean. The sea-wind which begins to blow at about 8 A.M., and dies away at sunset, impels the waters towards the shore. Logically this should make the level of the sea higher at mid-day than at 8 o'clock in the morning. The exact contrary is the case, not only at Nice, but along the whole coast from Cette to Leghorn.

The force of the wind in storms has a remarkable effect on the sea-level. On Christmas Day, 1870, during a great storm at Cette, the sea rose 3 feet 7 inches above the mean level, and at Trieste, on the 14th of October, 1875, a gale produced a rise of 6 feet 6 inches above mean low water. The engineers at Venice reckon a possible difference of level of 9 feet 10 inches between the highest rise and the lowest fall.

Among the modifying causes of the feeble and seemingly arbitrary tides of the Mediterranean are the eastern and western direction of the sea, the form of the coasts, with the interposed peninsulas and islands, and, most important of all, the nearly complete separation from the ocean.

PIONEERS OF WESTERN CIVILIZATION.—Messrs. Bonvalot and Capus, who have been doing for two years past, with great energy, a work of exploration in Central Asia, reached India at the beginning of September, after many hardships in crossing the Pamir. They started on the 19th March, so that they were nearly six months on the way, struggling through snows, losing the road, arrested frequently and detained, and often in danger of starvation. The details of these and other adventures, when told in a connected form, will be extremely interesting. Mean-

while M. Bonvalot has written to the *Journal des Débats* (as reported in the *London Times*) a charmingly frank letter. He says that thirteen days after starting on the journey he and his companions reached a Chinese post. They asked their way, but were told that they must go back, the officer in command declaring that he would be put to death if he allowed them to pass without an order from Kashgar. Messrs. Bonvalot and Capus put their heads together and determined to defy the Chinese authority; and they did it in this way. They invited the chief officer to drink tea with them, and when they had him fairly in their power, M. Bonvalot, "without regarding the laws of hospitality," thrashed him with a stick and threatened to cut off his ears if he did not supply them immediately with camels. If all this be true, M. Bonvalot must be a remarkable person, destitute of regard for several things besides the laws of hospitality.

It is more than possible, however,—for the name of Kashgar is suggestive,—that the whole story is an Arabian Nights' tale, and it would be a satisfaction to read the Chinese officer's version of the affair, if there was any.

THE PARTS OF THE WORLD.—According to the *Gazette Géographique*, Mr. E. Hansen Blangsted is said to have expressed the opinion that the accepted division of the world into five parts does not state the facts of the case. What is to be done with the Polar Region?

The remark is just, but is there not a doubt as to what is meant by *the* Polar Region?

Admitting that there are two poles and a region for each, there is still left an uncertainty as to further subdivisions, and the gain in any case does not seem to be equal to the outlay.

GIACOMO BOVE.—This distinguished Italian traveller, who, at the age of thirty-five years, had already won an honorable name among the explorers of the present day, died by his own hand at Verona on the 9th August, 1887. His last expedition was to the Congo, from which he returned with broken health, and, it is believed, with the germs of the malady that brought on his untimely end.

It was, possibly, ill-health that made him take his gloomy views of the Central African region. "The Lower Congo," he wrote, "is in no sense a fine country. When I left Italy I thought very differently of the great African river. I had read about it, and I knew, indeed, that the vegetation was not rich, that the banks were thinly peopled, and that the animal life was but limited; yet I never could have believed that the plant life was so poor, and the population so scanty, and the whole nature so nearly dead."

Signor Cucca, in the *Bollettino* of the *Società Africana*, implies that Bove's career was in a sense a failure, even to himself; but it is not easy to make the public responsible for such failures, because it is equally ready to bestow exaggerated praise and unmerited blame, and Signor Cucca is much more nearly right when he adds that there is no exact measure for things. It is not possible that there should be, for, even with the best intentions, no one could give an exact account of his own career. The man must bear what comes to him. To the public he is but one of a countless multitude.

NEW GUINEA EXPLORATION.—*Nature*, of August 11th, quotes from the *Sydney Morning Herald* the report of Mr. Theodore Bevan's exploring expedition in New

Guinea in the early part of the year. Mr. Bevan, in the *Victory*, entered the Aird River, which proved to be but one of several mouths of a large river to which was given the name of the "Douglas."

This stream was ascended for 130 miles, through a country covered with forests.

A channel (marked on the Admiralty chart as dry land) led from the Douglas into Deception Bay. Near Bald Head, the eastern headland of the Gulf of Papua, was discovered another large river, opening into the gulf through six mouths. This river was ascended for 110 miles, in a general E. N. E. direction, though the stream was very winding. In one place it was nearly half a mile wide and flowed through a magnificent hill country, with towering blue mountain peaks in the distance. The hills were all clad with trees, and watercourses were seen glistening in the sun. This was thought by the discoverer to be the finest river in British New Guinea, and he did not shrink from bestowing upon it the name of the "Jubilee."

Seven tribes of natives were met with, all, except the first, friendly. The hostile tribe, encountered at about twenty miles from the mouth of the Aird, was put to flight by the steam whistle, the arm of which Stanley has made such good use. The largest of these tribes was the Kiwa Pori, which numbered 400 or 500 men; and, except along the coasts, the country seemed uninhabited.

The land at the head of the deltas and near the hills was rich, and the sago, banana, tobacco, bread-fruit, and sugar-cane were found to be indigenous.

The expedition secured about 80 birds, besides a few reptiles and fishes and a considerable ethnological collection. The temperature ranged from 72° at daybreak to 86° at noon.

THE FRENCH CONGO.—In the *Revue Coloniale Internationale* of Sept.–Oct., M. Ferdinand Galibert shows what has not been done to develop the French Congo, as well as certain other West African possessions of France. He relates that some young men set out from France for the African coast.

They had to choose between a Liverpool and a Hamburg steamer. “We noticed,” says one of the emigrants, “at the many stopping-places on the way, that there were foreign flags to be seen, but not the French.” They reached the Gaboon—a French colony—after a month’s voyage, and had to accept the hospitality of a Portuguese. The commerce of the Gaboon with Europe is maintained by four steamers a month, two English and two German, and from the Gambia to the Benguela almost the whole trade is carried on under these two flags, their only competitor being the Portuguese line of steamers. There is a lighthouse without a light at the Gaboon; a small matter when, according to the *Revue*, ships drawing 15 *metres* can enter the road at any time in daylight. Libreville, the chief place, is being absorbed by Glass, with its five important English and German houses. The return of imports and exports of the colony for 1884 is eloquent: France, 427,565 fr.; other nations, 8,834,931 fr. It was necessary to take the foreign steamer to reach the Ogowe. Here the most important point, Lambaréné, is 150 miles inland, and Mr. Galibert makes the reasonable reflection that the rich products of Africa come from a great distance, and that for their transport the labor of slaves will always be cheaper, so long as communications are open, than the least expensive European methods.

He finds that the English secured and long monopolized the trade of Western Africa by establishing factories and

agencies at points along the coast and regular monthly lines of vessels to keep them supplied ; so that the English merchandise formed and developed the native demand.

The Germans have followed the English example and thrown upon the market, not German articles, but the articles the natives want, and at low prices.

The French must do the same thing, if they are to keep their place in West Africa. The greatest obstacle in their way is, M. Galibert shows, the government monopoly in certain products.

Powder, for instance, which is delivered on board ship at Hamburg for 1 fr. 10 per 3 lbs., costs in France 1.50 ; while, after paying duty at the Gaboon, the German article costs (with the advantage of the government premium of 20 centimes) 1 fr. 20, and the French, 1.62. Leaf tobacco costs at Hamburg 1 fr. 35 per kilogramme, and in France, 1 fr. 80, while the German can be delivered for consumption in the Gaboon for 33 centimes per kilogramme less than the French.

M. Galibert's facts seem to be undeniable, and his arguments, in the main, sound ; but his conclusion, which throws the responsibility for the feeble development of French commerce in West Africa on the "ephemeral governments and not less ephemeral innovations," which succeed each other in France, is far from sound. The monopolies of powder and tobacco were not invented by the ephemeral governments, and monopolies of a similar character may be found in countries blessed with what are called permanent forms of rule and administration. A settled line of policy, if it is right, is preferable to an innovation, which is adopted merely because it is new ; but M. Galibert does not appear to consider that, with

changing relations, there must often be a change of policy as well as of plan. There is not even yet a generally accepted definition of the word *colonization*.

The underlying purpose in the foundation of colonies at the present day is undoubtedly the expansion of trade, and this has always been the English purpose. The French colonies were planted on a different principle, and without the innovations and essays, of which M. Galibert complains, they cannot be modernized.

THE PEARL FISHERY IN THE PACIFIC.—In an article on the "Cruises of the German War-Ships in 1886," the *Deutsche Kolonialzeitung* gives, from a French report, some details of the pearl fishery in the Society Islands.

The naturalist, who made the report to the Minister of Marine, found that the pearl-oyster was threatened with destruction, and that by judicious management it might be saved.

Of the eighty islands comprising the Society group, there are but five or six that do not produce pearls. The best mother-of-pearl is supplied by Tahiti, where the oyster-banks run the greatest danger, because the whole population, including the women and children, is actively engaged in the fishery. The women are by no means the least skilful divers, and three of them are famous, in all the group, for their courage and dexterity.

The islanders dive to a depth of twenty-five fathoms, and even more, and can remain under water for three minutes at a time. They are in constant peril from the sharks, and their occupation is besides very hurtful to the health. They are careful, especially at the beginning of the season, not to go down too often in one day. The habit of diving develops disease of the lungs and other

internal organs, and it must be given up after a certain age, or it brings on paralysis.

Very few of the Tahitian pearl-fishers work for their own account, most of them being hired by the day at the rate of five francs. They begin work early in the morning after having assembled and listened with attention to a prayer, offered up by the most respected one of their number. The other preparations are soon made; the diver throws off his clothes and plunges in, taking only a glass with which he surveys his field of operations. With this glass, in the wonderfully clear water of the South Sea lagoons, he discovers the oysters at a very considerable depth.

The divers in the Indian Ocean and the Persian Gulf put on a dress, loaded so as to facilitate their sinking, and protect their eyes and ears and mouth, and make use of a line to aid them in rising to the surface; but they do not remain under the water so long nor dive to such great depth as the Tahitians. Though these are able to hold out for three minutes, the average stay at great depths is about one minute and a half.

Repeated efforts have been made to introduce the diving-apparatus, but without success, which is to be regretted, for three Europeans found that not only did its use increase the haul of oysters, but the sight of the diver dressed in it alarmed and chased away the sharks.

At the end of the day's labor the oysters are opened with knives in the presence of the owners, who watch the operation with the greatest vigilance, because the Tahitians, though they have no pockets, are amazingly quick in concealing the pearls about their persons, the moment they think themselves unobserved.

The fishery is prosecuted all through the year, but

particularly in November, December, January, and February. In June, July, and August, the winter of the Southern Hemisphere, the water is too cold in the early part of the day, and the divers go to their work in the afternoon.

MONUMENT TO PURDY PASHA.—The *Bulletin* of the Khedivial Geographical Society for June, 1887, publishes in full the proceedings of the Society at the dedication of the monument erected by the members in the American Cemetery at Old Cairo, to the memory of E. Sparrow Purdy.

The monument is in the form of a small Egyptian temple in gray granite, surmounted by an obelisk in Trieste stone. On this is sculptured in relief a palm with the name PURDY in letters of gold. The front of the temple bears the inscription :

To
ERASTUS SPARROW PURDY
THE
KHEDIVIAL GEOGRAPHICAL SOCIETY
IN MEMORY
1884

At the other end are the words :

BORN IN THE STATE OF NEW YORK 1838
COLORADO EXPEDITION 1857
DARFUR AND HOJRAT-EN-NAHAS 1874-1876
DIED AT CAIRO JUNE 21 1881

These inscriptions are in French. Abbate Pasha, Vice-President of the Society, presented in a brief address the salient points of Gen. Purdy's career, and especially dwelt upon his geographical work in Darfur, which he conquered as an Egyptian officer and explored as a man of science.

He was followed by Col. Mohamed Moktar Bey, who gave expression to the sentiments of regard and affection with which he and his brother officers cherished the memory of Purdy.

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* Articles thus marked are in English.

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Map of the Congo Free State — Exploration of
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Ivens's African Journey — Railroads of the
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tion of the Antarctic Regions — The Ptolemy of
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